

NEW SPECIES OF SUBGENUS COPTOPHLEBIA FROM SHENNONGJIA, HUBEI (DIPTERA, EMPIDIDAE)

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Abstract Five new species of the subgenus *Coptophlebia* from Shennongjia Hubei are described: *Empis (Coptophlebia) apiciset* sp. nov., *E. (C.) basiflava* sp. nov., *E. (C.) digitata* sp. nov., *E. (C.) pallipilosa* sp. nov., *E. (C.) postica* sp. nov.

Key words Diptera, Empididae, *Empis (Coptophlebia)*, new species, China

Coptophlebia Bezzi is one of the largest subgenera in the genus *Empis* Linnaeus with 161 known species which are distributed worldwide (Yang *et al.*, 2007). It is characterized by M1 reduced and not reaching the wing margin. Here five new species are reported from Shennongjia Hubei. The types are deposited in the Entomological Museum of China Agricultural University (CAU), Beijing. The following abbreviations are used: acr = acrostichal; ad = anterodorsal; av = anteroventral; d = dorsal; dc = dorsocentral; h = humeral; npl = notopleural; oc = ocellar; pd = posterodorsal; prsc = prescutellar; psa = postalar; pv = posteroventral; sa = supraalar; sc = scutellar; v = ventral.

Key to species of subgenus *Coptophlebia* from Shennongjia

- 1 Thorax black; antenna black 2
Thorax yellow with blackish dorsal markings; antennal scape and pedicel yellow *E. (C.) basiflava* sp. nov.
- 2 Legs entirely blackish or black 3
Legs blackish except bases of femora and extreme bases of tibiae brownish yellow *E. (C.) pallipilosa* sp. nov.
- 3 Hairs and bristles on body normal; tergite 6 without processes ... 4
Hairs and bristles on body well developed; tergite 6 with one pair of ear-like lateral processes *E. (C.) apiciset* sp. nov.
- 4 Brownish stigma present; M1 and M2 strongly convergent toward base *E. (C.) digitata* sp. nov.
Stigma indistinct; M1 and M2 not strongly convergent toward base *E. (C.) postica* sp. nov.

- 1 *Empis (Coptophlebia) basiflava* sp. nov. (Figs 1–2)

Diagnosis Thorax yellow with blackish dorsal markings. Antenna black except scape and pedicel yellow; style very short (1/3 as long as first flagellomere).

Female Body length 3.8–3.9 mm, wing length 4.5–4.7 mm.

Head black with grayish pollen. Eyes dark brownish yellow, separated. Hairs and bristles on head black. Ocellar tubercle distinct with 2 oc.

Antenna black except scape and pedicel yellow; first flagellomere long conical, 4.7 times longer than wide; style black, 0.3 times as long as first flagellomere. Proboscis 2.4 times longer than head height, blackish with few black short hairs; palpus yellow with short black hairs.

Thorax yellow with grayish pollen except scutum with three anterior median blackish stripes connecting large mid-posterior blackish spot and two lateral postsutural blackish spots; scutellum entirely black; postnotum blackish except postero-lateral area dark yellow. Hairs and bristles on thorax black. Hairs and bristles on scutum sparse and long, 1 h, 1 h, 1 pl, 3 npl, acr biserial and very sparse; dc nearly uniserial and long sparse; 1 sa, 1 psa, 1 prsc; scutellum with one pair of sc. Legs (including all coxae) yellow except tips of femora black; fore tibia from base outward dark brown, mid and hind tibiae with apical portion dark brown; tarsi black. Hairs and bristles on legs black. Fore and mid femora somewhat bare ventrally; hind femur with dense dorsal and ventral hairs. Fore tibia and tarsus (except tarsomere 1) with dense ventral micropubescence. Fore tibia with one row of dense pd, apically with 1 pd and 1 av. Mid tibia with two rows of dense d along whole length and one row of dense long av on apical 1/3, apically with 3 bristles. Mid tarsomere 1 with one row of v. Hind tibia and tarsus not distinctly thickened; hind tibia with distinct dorsal hairs, apically with 3 bristles. Wing hyaline, stigma indistinct, veins blackish. A weak but visible at tip. Halter yellow with base dark brown.

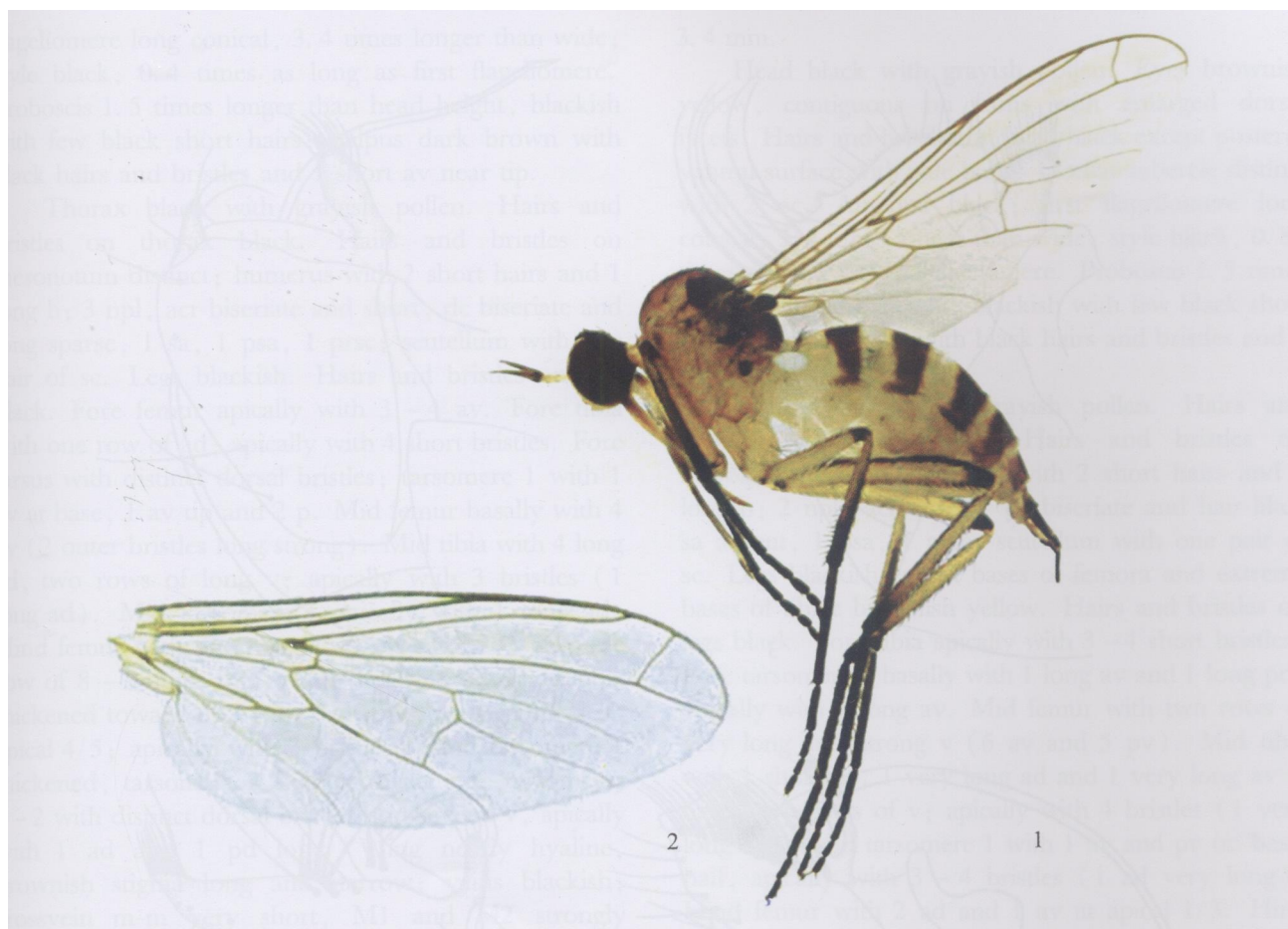
Abdomen nearly straight, but apically curved downward, yellow with thin gray pollen except tergite 1 with brown posterior margin; tergites 2–6 dark brown except bases of tergites 2–4, and dark brown tip. Hairs and bristles on abdomen black.

Male Unknown

The research was funded by the Doctoral Program of Higher Education of China (20090008110016) and the National Natural Science Foundation of China (30790259).

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Received 18 May 2010; accepted 23 July 2010



Figs 1–2 *Empis (Coptophlebia) basiflava* sp. nov. 1. Body, lateral view. 2. Elytron

Holotype ♀, paratypes 4 ♀ ♀, Hubei Shennongjia Guannenshan, 2 July 2009, LIU QiFei

Remarks The new species is similar to *Empis (Coptophlebia)* Yang Yang *et* Hu from Hainan, but it can be easily separated from the latter by the antenna black except the scape and pedicel yellow and very short style (1/3 as long as the first flagellomere). In *hainanensis*, the antenna is entirely black and the style is long (0.7 times as long as the first flagellomere) (Yang Yang & Hu, 2002).

Etymology The specific name refers to the yellow base of the antenna

2 *Empis (Coptophlebia) apiciseta* sp. nov. (Fig 3)

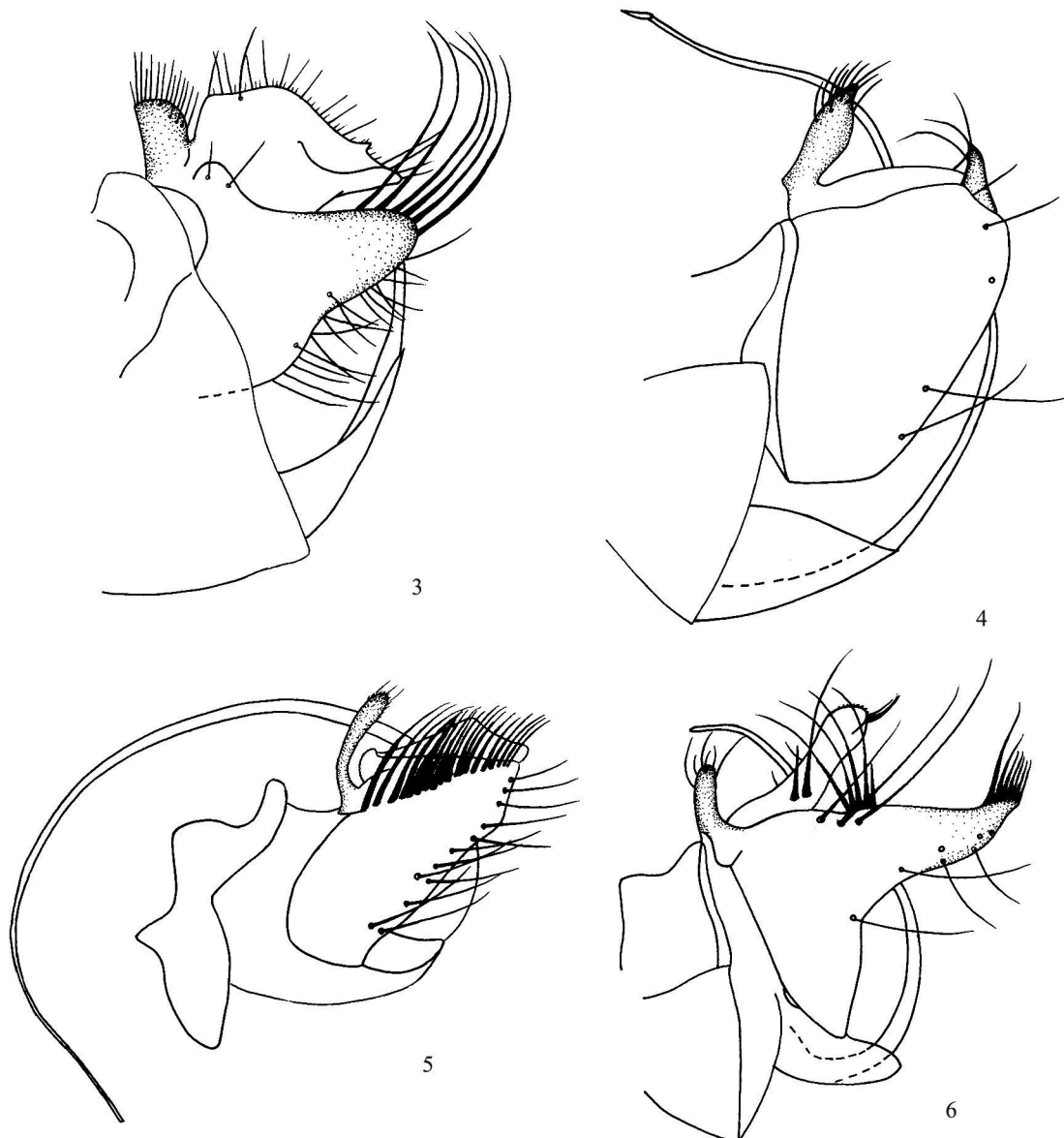
Diagnosis Hairs and bristles on body well developed. Tergite 6 with one pair of ear-like lateral processes

Male Body length 4.5–4.6 mm, wing length 4.0–4.1 mm

Head black with grayish pollen. Eyes brownish yellow, contiguous on frons with enlarged dorsal facets. Hairs and bristles on head black. Ocellar tubercle distinct with 2 oc. Antenna black; first flagellomere long conical, 3 times longer than wide; style black, 0.65 times as long as first flagellomere

Proboscis 1.6 times longer than head height; blackish with few black short hairs; palpus dark brown with black hairs and bristles and 1 short v near tip

Thorax black with grayish pollen. Hairs and bristles on thorax black. Hairs and bristles on mesonotum distinct; humerus with 2 short hairs and 1 long h; 3 npl, acr biseriate and short; dc nearly uniseriate and long sparse; 1 sa, 1 psa, 1 prsc; scutellum with one pair of sc. Legs black. Hairs and bristles on legs well developed and black; bristles mostly strong. Fore femur with one row of hair-like av (longer at base). Fore tibia and tarsus with dense ventral micropubescence and with two rows of d (some long strong). Fore tibia apically with 4–5 bristles. Mid femur with one row of av and one row of pv (longer than av). Mid tibia with 2–3 ad, 1 pd, 2 av and one row of short thin pv, apically with 3 bristles. Mid tarsomere 1 with 3 av and 1 pv, apically with 3 long bristles. Hind femur with one row of long thin av and one row of long thin pv on basal half. Hind tibia and tarsus not distinctly thickened; hind tibia with strong bristles including 4–5 long ad, 3–4 long pd, 3 long av and 2 pv, apically with 3 bristles. Hind tarsomeres 1–2 with two rows of long d and two rows of short thick v. Wing nearly hyaline; indistinct brownish stigma long and narrow; veins



Figs 3– 6 Male genitalia lateral view. 3 *Empis (Coptophlebia) apiciseta* sp. nov. 4 *Empis (Coptophlebia) digitata* sp. nov. 5 *Empis (Coptophlebia) pallipilosa* sp. nov. 6 *Empis (Coptophlebia) postica* sp. nov.

blackish, a weak but indistinct at tip. Halter dark brown.

Abdomen nearly straight, black, with thin gray pollen. Tergite 6 with one pair of ear-like lateral processes posteriorly. Hairs and bristles on abdomen black; apical portion with long ventral hairs. Male genitalia: epandrial lobe subtriangular with very long dorsal bristles at apex; cercus rather large with basal process wide; phallus long and thin.

Female Unknown.

Holotype ♂, paratype 1 ♂, Hubei Shennongjia Guamenshan, 2 July 2009, LIU Qi-Fei.

Remarks: The new species is peculiar and can be easily separated from other known species of the genus by the hairs and bristles on the body well developed

and abdominal tergite 6 with one pair of ear-like lateral processes.

Etymology. The specific name refers to the long apical bristles of the epandrial lobe.

3 *Empis (Coptophlebia) digitata* sp. nov. (Fig. 4)

Diagnosis. M1 and M2 strongly convergent toward base. Legs blackish. Mid femur basally with 4 av (2 outer bristles long strong). Mid tibia with one row of 3–4 long ad and two rows of long v.

Male. Body length 3.9–4.2 mm, wing length 3.4–3.8 mm.

Head black with grayish pollen. Eyes brownish yellow, contiguous on frons with enlarged dorsal facets. Hairs and bristles on head black. Ocellar tubercle distinct with 2 oc. Antenna black; first

flagellomere long conical 3.4 times longer than wide; style black, 0.4 times as long as first flagellomere. Proboscis 1.5 times longer than head height; blackish with few black short hairs; palpus dark brown with black hairs and bristles and 1 short av near tip.

Thorax black with grayish pollen. Hairs and bristles on thorax black. Hairs and bristles on mesonotum distinct; humerus with 2 short hairs and 1 long h; 3 np1, acr biseriate and short; dc biseriate and long sparse; 1 sa, 1 psa, 1 prsc; scutellum with one pair of sc. Legs blackish. Hairs and bristles on legs black. Fore femur apically with 3–4 av. Fore tibia with one row of ad; apically with 4 short bristles. Fore tarsus with distinct dorsal bristles; tarsomere 1 with 1 av at base, 1 av tip and 2 p. Mid femur basally with 4 av (2 outer bristles long strong). Mid tibia with 4 long ad, two rows of long v; apically with 3 bristles (1 long ad). Mid tarsomere 1 apically with 1 long ad. Hind femur with one row of ad on basal 2/3 and one row of 8–9 long thin av on apical 1/3. Hind tibia thickened toward tip with two rows of long thin d on apical 4/5; apically with 3 bristles. Hind tarsomere 1 thickened; tarsomere 2 slightly thickened; tarsomeres 1–2 with distinct dorsal bristles and several v; apically with 1 ad and 1 pd long. Wing nearly hyaline; brownish stigma long and narrow; veins blackish; crossvein m-m very short; M1 and M2 strongly convergent toward base; a weak but visible apically. Halter dark brown.

Abdomen apically weakly or distinctly curved downward; blackish except hypopygium black with thin gray pollen. Hairs and bristles on abdomen black. Male genitalia: epandrial lobe large and broad with apex strongly curved inward with very long bristles at outer margin strongly curved inward; cercus narrow with basal process thick finger-like; phallus very long and thin.

Female Unknown.

Holotype ♂, Hubei Shennongjia, Dalongtan, 1 July 2009, LU Qifeng. Paratype 1 ♂, Hubei Shennongjia, Dabangtan, 28 June 2009, LU Qifeng.

Remarks. This new species is peculiar and can be easily separated from other known species of the subgenus by M1 and M2 strongly convergent toward the base and apex of the epandrium strongly curved inward.

Etymology. The specific name refers to the digitiform cercus.

4 *Empis* (*Coptophlebia*) *pallipilosa* sp. nov. (Fig. 5)

Diagnosis. Style long 0.85 times as long as first flagellomere. Acr absent. Legs blackish except bases of femora and extreme bases of tibiae brownish yellow.

Male. Body length 3.7 mm, wing length

3.4 mm.

Head black with grayish pollen. Eyes brownish yellow, contiguous on frons with enlarged dorsal facets. Hairs and bristles on head black except posteroventral surface with pale hairs. Ocellar tubercle distinct with 2 oc. Antenna black; first flagellomere long conical 2.5 times longer than wide; style black 0.85 times as long as first flagellomere. Proboscis 1.5 times longer than head height; blackish with few black short hairs; palpus brown with black hairs and bristles and 1 short v near tip.

Thorax black with grayish pollen. Hairs and bristles on thorax black. Hairs and bristles on mesonotum weak; humerus with 2 short hairs and 1 long h; 2 np1, acr absent; dc biseriate and hair-like; sa absent; 1 psa, 1 prsc; scutellum with one pair of sc. Legs blackish except bases of femora and extreme bases of tibiae brownish yellow. Hairs and bristles on legs black. Fore tibia apically with 3–4 short bristles. Fore tarsomere 1 basally with 1 long av and 1 long pd apically with 1 long av. Mid femur with two rows of very long and strong v (6 av and 5 pv). Mid tibia with 1 short ad, 1 very long ad and 1 very long av at base; two rows of v; apically with 4 bristles (1 very long ad). Mid tarsomere 1 with 1 av and pv on basal half; apically with 3–4 bristles (1 ad very long). Hind femur with 2 ad and 1 av at apical 1/3. Hind tibia slightly thickened apically with one row of ad (1 ad at middle long), one row of av (1 outermost av long) and 1 long pv near middle; apically with 3 bristles (1 pd very long). Hind tarsomere 1 thickened with 2 very long ad, 1 very long pd and 1 long av; apically with 6 bristles (1 ad and 1 pd long); tarsomere 2 slightly thickened; apically with 1 long ad and 1 long pd. Wing nearly hyaline; brownish stigma long and narrow; veins blackish; a indistinct apically. Halter pale brown.

Abdomen nearly straight; blackish with thin gray pollen. Hairs and bristles on abdomen pale except those on apex black. Male genitalia: epandrial lobe distinctly longer than wide with long dense bristles at dorsal margin; cercus rather large with basal process finger-like; phallus very long and thin.

Female Unknown.

Holotype ♂, Hubei Shennongjia, Dalongtan, 28 June 2009, LU Qifeng.

Remarks. The new species is somewhat similar to *Empis* (*Coptophlebia*) *pallipilosa* Daugeron, Grootaert *et al.* Yang from Guangdong in the legs not uniformly dark and very long phallus, but it may be separated from the latter by the fore tibia not deformed and acr absent. In *pallipilosa*, the fore tibia is strongly deformed and acr is present (Daugeron, Grootaert *et al.* Yang, 2003).

Etymology. The specific name refers to the pale

hairs and bristles of the abdomen

5 *Empis* (*Coptophlebia*) *postica* sp. nov. (Fig 6)

Diagnosis Wing hyaline, stigma indistinct. Fore tarsomere 1 with 1 strong posterior bristle.

Male Body length 3.7 mm, wing length 4.1 mm.

Head black with grayish pollen. Eyes brownish yellow, contiguous on frons with enlarged dorsal facets. Hairs and bristles on head black. Ocellar tubercle distinct with 2 oc. Antenna black, first flagellomere long, subconical, 4.2 times longer than wide, style black, 0.55 times as long as first flagellomere. Proboscis 1.4 times longer than head height, blackish with few black short hairs, palpus dark brown with black hairs and bristles and 1 short v near tip.

Thorax black with grayish pollen. Hairs and bristles on thorax black. Hairs and bristles on mesonotum distinct, humerus with 2 short hairs and 1 long h, 3 np, acr biseriata, dc nearly biseriata, 1 sa, 1 psa, 1 prsc, scutellum with one pair of sc. Legs black. Hairs and bristles on legs black. Fore femur with one row of weak hair-like av (3 av at tip distinct). Fore tibia and tarsus with dense ventral micropubescence. Fore tibia with one row of long or short av. Fore tarsomere 1 with 1 av at base and 1 strong p near tip, apically with 4 strong or weak bristles. Fore tarsomeres 2–4 with 1 long av and pv at tip. Mid femur with one row of long av on basal 1/3 and one row of long pv on basal 2/3. Mid tibia with 2–3 ad, 1 pd, 3–4 av and 2–5 pv, apically with 3 bristles. Hind femur with 2–3 av at tip. Hind tibia and tarsus not distinctly thickened, hind tibia with 2–3 ad and 1 av, apically with 3 bristles. Hind tarsomere

1 with 1 av and 1 pv, apically with 3 bristles. Wing hyaline, stigma indistinct, veins brownish, a weak but visible at tip. Halter dark brown.

Abdomen nearly straight, black, with thin gray pollen. Hairs and bristles on abdomen black. Male genitalia: epandrial lobe distinctly elongated with group of dense dorsal bristles at middle and tip, cercus long, thick, finger-like with basal process short thin finger-like, phallus long and thin.

Female Unknown.

Holotype ♂, Hubei Shennongjia Zhangbaohu, 3 July 2009, LIU Qi-Fei.

Remarks The new species is somewhat similar to *Empis* (*Coptophlebia*) *incurva* Daugeron et Grootaert from Yunnan in the epandrium distinctly elongated, but it may be separated from the latter by the wing hyaline with the indistinct stigma and acrobiserial. In *incurva*, the wing is tinged with brown and acrobiserial (Daugeron et Grootaert, 2005).

Etymology The specific name refers to 1 well developed posterior bristle on fore tarsomere 1.

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湖北神农架缺脉舞虻亚属五新种 (双翅目, 舞虻科)

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摘要 记述湖北神农架缺脉舞虻亚属 *Coptophlebia* 5新种, 即端鬃缺脉舞虻 *Empis* (*Coptophlebia*) *apiciseti* sp. nov., 基黄缺脉舞虻 *E. (C.) basiflava* sp. nov., 指突缺脉舞虻 *E. (C.) digitata* sp. nov., 白毛缺脉舞虻 *E. (C.) pallipilosa* sp. nov., 后鬃缺脉舞虻 *E. (C.) postica* sp. nov.

1 基黄缺脉舞虻, 新种 *Empis* (*Coptophlebia*) *basiflava* sp. nov. (图 1~2)

新种与海南缺脉舞虻 *E. (C.) hainanensis* Yang, Yang et Hu 近似, 触角基部黄色, 端刺很短 (长为触角第 2 节的 1/3)。

正模♀, 副模 4♀, 湖北神农架官门山, 2009-07-02 刘启飞。

词源: 种名意指触角基部黄色。

2 端鬃缺脉舞虻, 新种 *Empis* (*Coptophlebia*) *apiciseti* sp. nov. (图 3)

新种独特, 身体毛和鬃发达, 雄性腹部第 6 背板有 1 对侧突, 易与本属其他已知种分开。

正模 ♂, 副模 1 ♂, 湖北神农架官门山, 2009-07-02 刘启飞。

词源: 种名意指生殖背板端部的长鬃。

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3 指突缺脉舞虻，新种 *Empis (Coptophlebia) digitata* **sp nov.** (图 4)

新种独特，M1和M2基部强烈会聚，生殖背板端部强烈内弯，易与本属其他已知种分开。

正模 ♂，湖北神农架大龙潭，2009-07-01，刘启飞。副模 1 ♂，湖北神农架大龙潭，2009-06-28，刘启飞。

词源：种名意指尾须指状。

4 白毛缺脉舞虻，新种 *Empis (Coptophlebia) pallipilosa* **sp nov.** (图 5)

新种与广东的足刺缺脉舞虻 *Empis (Coptophlebia) pedispinosa* Daugeron, Grootaert *et* Yang 有些近似，但前足胫节形状不发

关键词 双翅目，舞虻科，缺脉舞虻亚属，新种，中国.

中图分类号 Q969.44

生特化，胸部无中鬃。

正模 ♂，湖北神农架大龙潭，2009-06-28，刘启飞。

词源：种名意指腹部白色的毛和鬃。

5 后鬃缺脉舞虻，新种 *Empis (Coptophlebia) postica* **sp nov.** (图 6)

新种与云南的弯茎缺脉舞虻 *Empis (Coptophlebia) incurva* Daugeron *et* Grootaert 有些近似，但翅透明，翅痣不明显，中鬃双列。

正模 ♂，湖北神农架漳宝河，2009-07-03，刘启飞。

词源：种名意指前足基跗节有 1 根发达的后鬃。